CHAPTER 4

CONCRETE TRAINING AND QUALIFICATION PROGRAM

4.1 PURPOSE

The purpose of this section is to describe the *Concrete Training and Qualification Program*. This program is designed to establish a qualification program for persons responsible for the manufacture, testing, placement, and inspection of concrete material on Florida Department of Transportation (Department) highway construction projects. This procedure shall list the details of the qualification program including the associated training courses.

4.2 BACKGROUND

The Department has required American Concrete Institute (ACI) Concrete Field Testing Technician Grade I certification for several years. Due to the requirement by the FHWA that, "All sampling and testing data to be used in the acceptance decision or the Independent Assurance program shall be executed by qualified sampling and testing personnel", ACI Concrete Field Testing Technician Grade I is no longer sufficient by itself. The Department's Concrete Technical experts have determined that concrete qualifications be divided into three levels with areas of specialization.

In addition, two courses have been included to ensure familiarity with current specifications.

4.3 QUALIFICATION REQUIREMENTS BY JOB FUNCTION

4.3.1 Concrete Field Technician – Level 1

This is the QC Technician who must be qualified to perform acceptance tests such as slump, temperature, air content and making/curing concrete cylinders.

Technicians who test concrete material properties or perform Independent Assurance (IA) reviews must also possess this qualification.

4.3.2 Concrete Field Inspector – Level 2

This is the contractor’s representative who must be responsible for the quality of the concrete being placed on major bridge projects. These responsibilities are not limited to substructure or superstructure.

The Department's lead inspector on a major concrete bridge structure must have this qualification.

The ACI CTCI certification, or the ACI Associate CTCI certification along with Pile Driving Inspector Qualification and/or Drilled Shaft Qualification, will be required on complex bridge jobs.

4.3.3 Concrete Laboratory Technician – Level 1

This is the Concrete Strength Testing Technician who must be qualified to break samples and record concrete strength for material acceptance.

Any person who tests concrete for material quality compliance or performs Independent Assurance (IA) must also possess this qualification.

Quality Control Manager at the concrete production facilities must have this qualification or alternative qualifications from the Materials Manual section 9.2.13.3.

4.3.4 Concrete Laboratory Technician – Level 2

The Concrete Laboratory Technician Level 2 qualified technician is a mix designer for concrete mix submittals.

The Department representative responsible for verifying the concrete mix design must have this qualification.

4.3.5 Concrete Batch Plant Operator

This person is an employee of the concrete producer who is identified in the Quality Control Plan as the individual who batches the concrete for the contractor.

Department employees may obtain this qualification for professional knowledge but it is not required for FDOT personnel.

Quality Control Manager at the concrete production facilities must have this qualification or alternative qualifications from the Materials Manual section 9.2.13.3.

4.4 QUALIFICATIONS AND TRAINING COURSES

There are five concrete qualifications and two "stand-alone" concrete training courses:

(1) Concrete Field Technician Level 1 Qualification

(2) Concrete Field Inspector Level 2 Qualification

(3) Concrete Laboratory Technician Level 1 Qualification

(4) Concrete Laboratory Technician Level 2 Qualification

(5) Concrete Batch Plant Operator Qualification

(6) FDOT Concrete Laboratory Specification Course and Examination

(7) FDOT Concrete Field Inspector Specification Course and Examination

So that present ACI Concrete Field Testing Technician Certified Technicians can qualify as Concrete Field Technician Level 1, a course on Florida specifications with an examination has been developed. These courses along with the criteria for becoming qualified are described in detail in the following text.

Certain qualifications in the FDOT Concrete Field Technician Level 1 program require ACI certification. In these instances, it will be the responsibility of the technician seeking qualification to submit an ***Application for Qualification form*** found on the CTQP website to the CTQP Administrator along with the ACI certification (wallet card) number. The date of qualification shall be the date the last qualification requirement was satisfied.

4.4.1 Concrete Field Technician Level 1 Qualification Requirements

The objective of this qualification is to assure that job site concrete tests including quality control, verification, and resolution tests for concrete construction, used as part of the acceptance program, are performed in accordance with the contract documents.

All trainees seeking Concrete Field Technician Level 1 qualification must:

(1) Hold a current ACI Concrete Field Testing Technician certification.

(2) Pass the FDOT Concrete Field Inspector Specification Examination.

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The CTQP qualification shall expire in 60 months or on the date of expiration of the earliest required ACI certification, whichever is earlier.

In order to be adequately prepared for and prior to taking the Concrete Field Technician courses, applicants are encouraged to take and pass the following Department self-study courses: Portland Cement Concrete Testing and Construction Math.

4.4.1.1 ACI Concrete Field Testing Technician Certification Course

This two or three day training program includes a class session, written examination (usually one hour), and proficiency examination (usually four hours).

This course uses the standard ACI written examination. Expect the grading and mailing of the examination results by ACI to take two to four weeks. For the most up-to-date requirements, please contact ACI.

Course Prerequisites

There are no prerequisites for this course; however, applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and the Construction Math self-study examinations.

Course Written Examination

A written examination (usually one hour) is administered at the end of the course (usually multiple choice). The examination is electronically graded by ACI. Expect the grading and mailing of the examination results by ACI to take two to four weeks.

Course Proficiency Examination

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skill in performing the proficiency tests. A trainee will be given two chances to pass each test. Failing any proficiency test twice will constitute failure of the

proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

4.4.1.2 FDOT Concrete Field Inspector Specification Course

This is a 2-1/2 day course with a 2-1/2 hours open book written examination, which covers ***Florida Department of Transportation Standard Specifications for Road and Bridge Construction Sections 346, 347, 400 and 415***. The examination is multiple choice. Taking the course is not a prerequisite to taking and passing the examination. Taking the course and passing the examination does not by itself confer qualification. There are additional requirements that must be met to achieve qualification.

Course Prerequisites

There are no prerequisites for this course.

Course Written Examination

A written examination (usually two and one half hours) is administered at the end of the course. Taking the course is optional and not required for taking the exam.

4.4.2 Concrete Field Inspector Level 2 Qualification Requirements

The objective of this qualification is to assure that all concrete related tests and inspections in the field including quality control, quality assurance, verification, and dispute resolution tests for concrete construction used as part of the acceptance program are performed in accordance with the contract documents.

All trainees seeking a Concrete Field Inspector Level 2 qualification must:

(1) Hold a current ACI Concrete Transportation Construction Inspector or ACI Associate Concrete Transportation Construction Inspector Certification

(2) Pass ACI Concrete Field Testing Technician examination

(3) Pass FDOT Concrete Field Inspector Specification Examination

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The date of qualification shall be the date the last qualification requirement was satisfied. The CTQP qualification shall expire in five years (60 months) or on the date of expiration of the ACI CTCI or Associate CTCI, whichever is later.

4.4.2.1 ACI Concrete Transportation Construction Inspector Training Course (CTCI)

This is a three-day course which includes a half-day written examination. The written examination is offered three to four weeks after the course is completed. For the most up-to-date requirements, please contact ACI.

Course Prerequisites

There are no prerequisites for this course.

Course Written Examination

A written examination (usually four hours, multiple choice) is offered three-four weeks after the course. Expect grading and mailing of the examination results by ACI to take two to four weeks.

4.4.2.2 ACI Associate Concrete Transportation Construction Inspector Training Course

This is a (2) two-day course which includes a written examination. For the most up-to-date requirements, please contact ACI.

Course Prerequisites

Prerequisites for this course include FDOT Concrete Field Technician Level I Qualification

Course Written Examination

A written examination (usually ninety minutes) is administered at the end of the course (usually multiple choices). A plans reading examination (usually thirty minutes) is also administered at the end of the course. The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

4.4.2.3 ACI Concrete Field Testing Technician

This two or three day training program includes a class session, written examination (usually one hour), and proficiency examination (usually four hours).

This course uses the standard ACI written examination. Expect the grading and mailing of the examination results by ACI to take two to four weeks. For the most up-to-date requirements, please contact ACI.

Course Prerequisites

There are no prerequisites for this course; however, applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and the Construction Math self-study examinations.

Course Written Examination

A written examination (usually one hour) is administered at the end of the course (usually multiple choice). The examination is electronically graded by ACI. Expect the grading and mailing of the examination results by ACI to take two to four weeks.

Course Proficiency Examination

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skill in performing the proficiency tests. A trainee will be given two chances to pass each test. Failing any proficiency test twice will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

4.4.2.4 FDOT Concrete Field Inspector Specifications Course

This is a 2-1/2 day course with a 2-1/2 hour open book written examination, which covers ***Florida Department of Transportation Standard Specifications for Road and Bridge Construction Sections 346, 347, 400 and 415***. The examination is multiple choice. Taking the course is not a prerequisite to taking and passing the examination. Taking the course and passing the examination does not by itself confer qualification. There

are additional requirements that must be met to receive a qualification.

4.4.3 Concrete Laboratory Technician Level 1 Qualification Requirements

The objective of this qualification is to assure that all laboratory strength tests that are used for quality control, quality assurance, verification, dispute resolution, and acceptance of concrete are performed in accordance with the ***Standard Test Methods***, project specifications and other contract documents.

All trainees seeking to become a qualified Concrete Laboratory Technician Level 1 must:

(1) Hold a current ACI Concrete Strength Testing Technician Certification

OR

(1) Hold a current ACI Concrete Laboratory Testing Technician Level 1 Certification

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The CTQP qualification shall expire in (5) five years (60 months) or on the date of expiration of the earliest required ACI certification, whichever is earlier.

4.4.3.1 ACI Concrete Strength Testing Technician Certification Course

This course is a one and one half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two to four hours).

Course Prerequisites

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the Concrete Strength

Testing Technician Certification Course.

Course Written Examination

A written examination is administered at the end of the course (usually multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

Proficiency Examination

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skills in conducting the tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any proficiency test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

4.4.3.2 ACI Concrete Laboratory Testing Technician Level 1 Certification Course

This course is a one and one half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two hours).

Course Prerequisites

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the course.

Course Written Examination

A written examination is administered at the end of the course (usually multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

Course Proficiency Examination

A proficiency examination (usually four hours) is administered at the end of

the course. Each trainee will be expected to correctly demonstrate skills in conducting the laboratory tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

4.4.4 Concrete Laboratory Technician Level 2 Qualification Requirements

The objective of this qualification is to assure that all laboratory test results that are used for quality control, quality assurance, verification, dispute resolution and acceptance of concrete are performed in accordance with ***Standard Test Methods***, project specifications and other contract documents.

All applicants seeking Concrete Laboratory Technician Level 2 qualification must:

(1) Hold a current ACI Concrete Laboratory Testing Technician Level 1 Certification

(2) Hold a current ACI Concrete Laboratory Testing Technician Level 2 Certification

(3) Pass the FDOT Concrete Laboratory Specification Examination. See ***Section 4.4.4.3*** for more details about this examination.

(4) Have one year experience in laboratory, sampling and testing aggregate for concrete and testing concrete.

After a trainee has successfully met all of the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The date of qualification shall be the date the last qualification requirement was satisfied. The CTQP qualification shall expire in (5) five years (60 months) or the earliest expiration date of one of the required ACI Certification(s).

4.4.4.1 ACI Concrete Laboratory Testing Technician Level 1 Certification Course

This course is a one and one half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two hours).

Course Prerequisites

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the course.

Course Written Examination

A written examination is administered at the end of the course (usually multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

Course Proficiency Examination

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skills in conducting the laboratory tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

4.4.4.2 ACI Concrete Laboratory Testing Technician Level 2 Course

This is a three-day ACI course called ACI Concrete Laboratory Testing Technician Level II. The course includes a written examination (usually two yours) and a proficiency examination (usually four hours. For the most up-to-date requirements please contact ACI.

Also included are the calculations for testing, calibration procedures for the testing devices/equipment and reporting of data using standard report forms. This instruction includes the use of random number tables.

Course Prerequisites

Check the ACI website for current ACI Course prerequisites

Course Written Examination

A written examination (usually two hours) is administered at the end of the course (multiple choice). The examination is electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

Course Proficiency Examination

A proficiency examination (usually four hours) is given at the end of the course. . Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and appropriate fee paid.

4.4.4.3 FDOT Concrete Laboratory Technician Specification Course and Examination

This is a 2-1/2 day course with a 2-1/2 hour open book written examination, which covers ***Florida Department of Transportation Standard Specifications for Road and Bridge Construction Sections 346, 347, 400 and 415***. The examination is multiple choice. Taking the course is not a prerequisite to taking and passing the examination. Taking the course and passing the examination does not by itself confer qualification. There are additional requirements that must be met to receive a qualification

4.4.5 Concrete Batch Plant Operator Qualification Requirements

The objective of this qualification is to assure that concrete design mixes are prepared in accordance with the ***Standard Specifications.***

All trainees seeking Concrete Batch Plant Operator qualification must:

(1) Pass the Concrete Batch Plant Operator's written examination.

(2) Have 90 days work experience in Batch Plant operations including the batching of fresh concrete, proportioning concrete mix designs, determining the moisture content of aggregates and calculating the water to cementitious materials ratio.

It is recommended that all applicants seeking qualification as a Concrete Batch Plant Operator take the Portland Cement Concrete Testing self-study course and pass the examination. After a trainee has successfully met all of these qualification requirements, the trainee's qualification date will be added to the training database. The qualification date shall be the date the last qualification requirement was satisfied. The qualification expiration date shall be 5 years (60 months) from the date the written examination was passed.

4.4 5.1 Concrete Batch Plant Operator Qualification Course

This course was developed by the Florida Department of Transportation as an independent self-study. The Concrete Batch Plant Operator Study Guide is available at: Concrete Batch Plant Operator Study Guide

Examination

A written examination (usually two hours, multiple choice) is required for this qualification. The examinations (usually 50-70 multiple choice questions) are electronically graded by the CTQP Administrator. Expect grading and posting of the examination results to take a minimum of two weeks.

4.5 REQUALIFICATION

The requirements for requalification are the same as those for initial qualification.

Due to constant changes in specifications, materials, and processes, certifications of qualification are issued for no more than 60 months. When the CTQP qualification includes a requirement to maintain an ACI certification, the CTQP qualification shall coincide with the ACI certification. It is the applicant's responsibility to maintain any CTQP qualification. Qualified technicians are required to submit an application for requalification.

The Department does not have a requalification notification program in effect. It is the

responsibility for every qualified person to apply for requalification. Any technician who fails to apply for requalification or to satisfy the requirements for requalification shall become disqualified one calendar day after the last day of the qualification period. A previously qualified person, who lets their qualification expire, must reapply for qualification.

Certain qualifications in the FDOT Concrete Field Inspector Specification program require ACI certification or other certifications. In these instances, it will be the responsibility of the technician seeking qualification to submit an Application for Qualification Form to the CTQP administrator along with the ACI certification (wallet card) number. The date of qualification will be the date the administrator receives notification that all requirements have been met.

The CTQP Concrete Laboratory Technician Level 2 Qualification does not require requalification. The qualification in this area is indefinite, unless revoked in accordance with ***Section 1.14.7 or 1.14.8.***

4.6 SUSPENSION AND REVOCATION OF QUALIFICATION

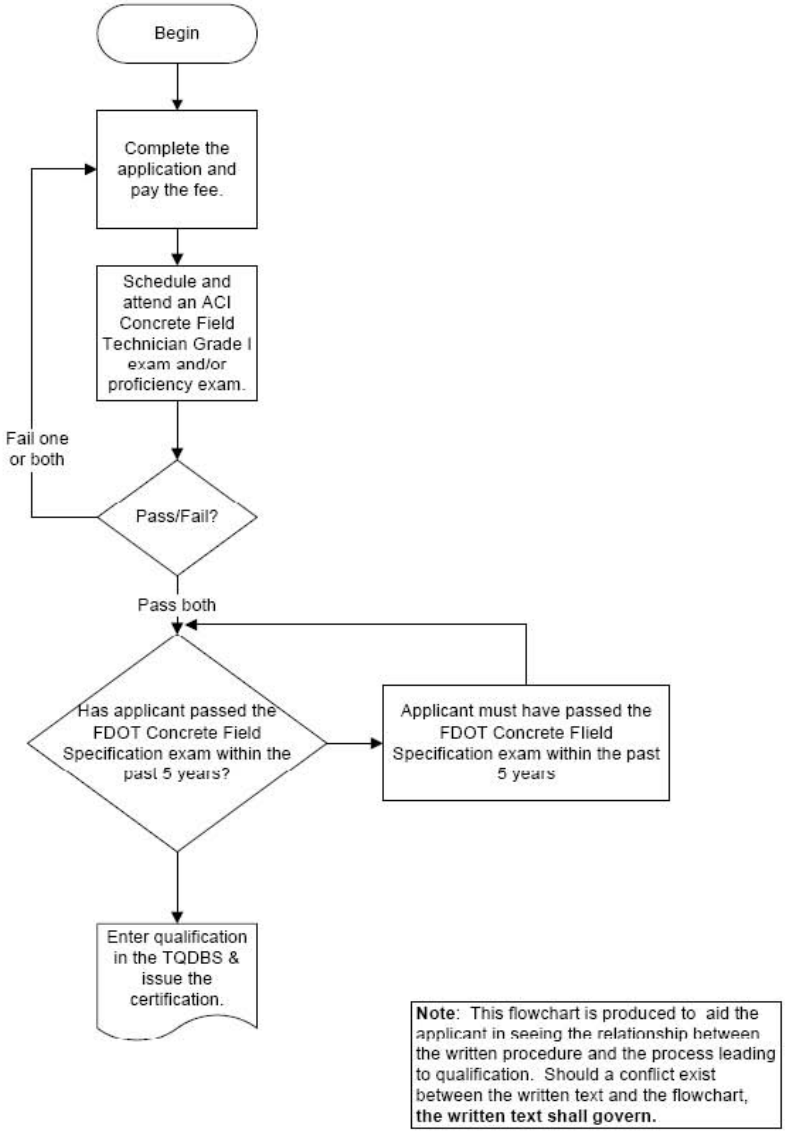
See ***Section 1.14.7 or 1.14.8.***

4.7 RESPONSIBILITIES

See ***Sections 1.10, 1.11, 1.12, and 1.13.***

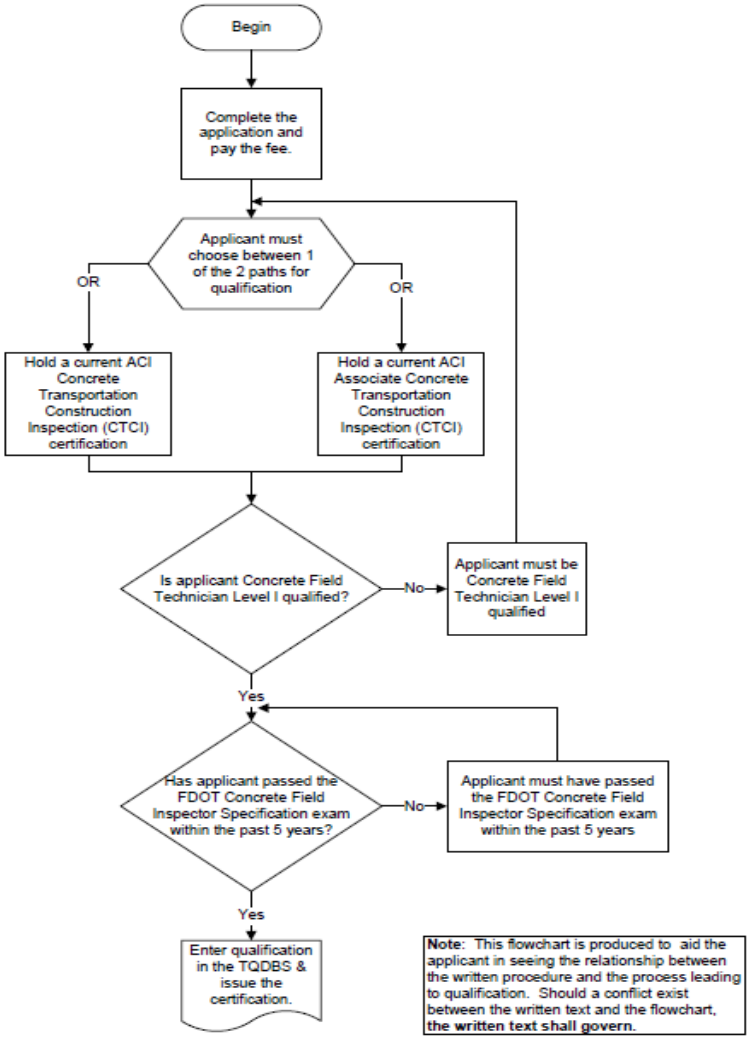
Attachment 4-1 Revised 08/01/2008

CONCRETE FIELD TECHNICIAN LEVEL I QUALIFICATION FLOWCHART



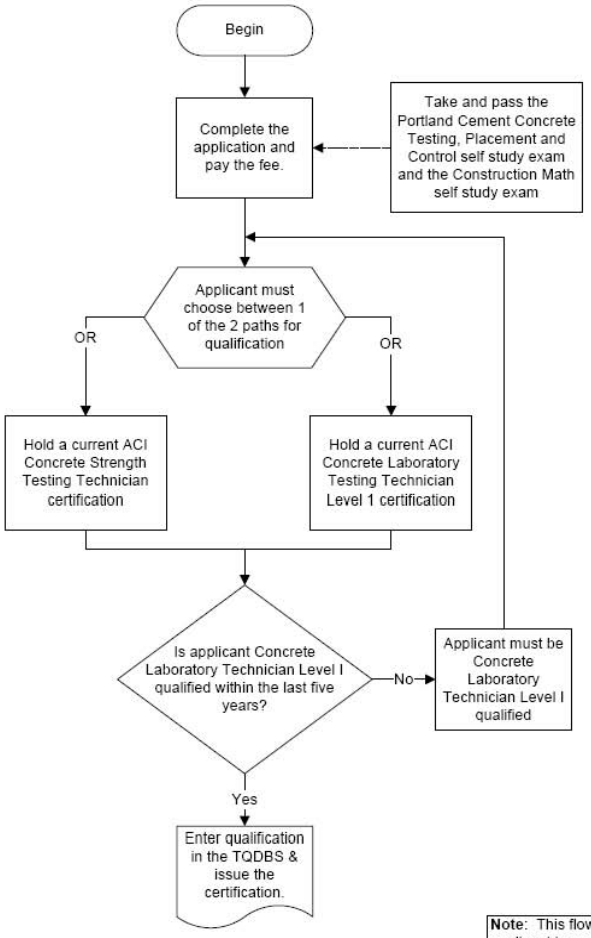
Attachment 4-2 Revised 01/12/2011

CONCRETE FIELD INSPECTOR LEVEL II QUALIFICATION FLOWCHART



Attachment 4-3 Revised 08/01/2008

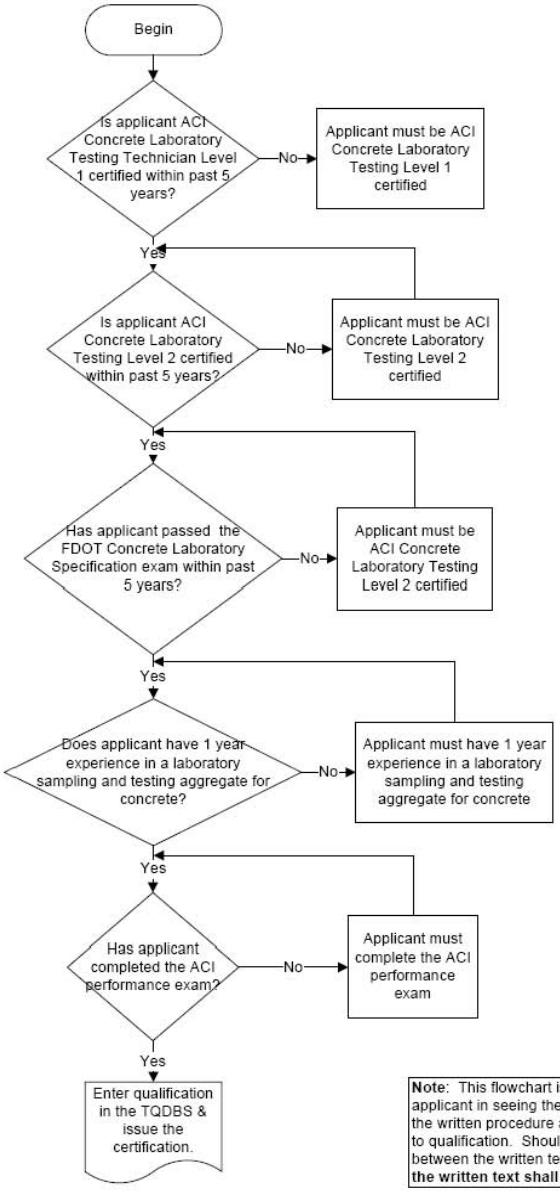
CONCRETE LABORATORY TECHNICIAN LEVEL I QUALIFICATION FLOWCHART



Note: This flowchart is produced to aid the applicant in seeing the relationship between the written procedure and the process leading to qualification. Should a conflict exist between the written text and the flowchart, **the written text shall govern.**

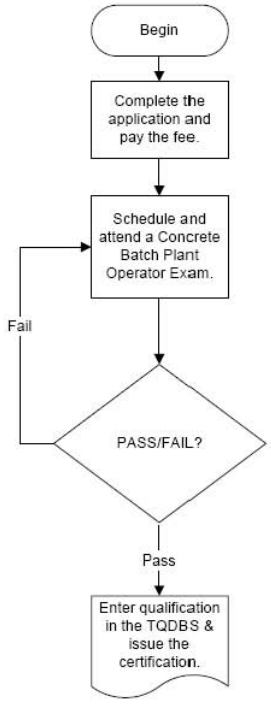
Attachment 4-4 Revised 08/01/2008

CONCRETE LABORATORY TECHNICIAN LEVEL II QUALIFICATION FLOWCHART



Attachment 4-5 Revised 08/01/2008

CONCRETE BATCH PLANT OPERATOR QUALIFICATION FLOWCHART



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